

City of Durham
Department of Transportation

January 19, 2011

Memorandum

To: Durham City-County Planning Department
From: Bill Judge P.E., Transportation Engineer IV
Subject: Erwin Square Apartments (Z1000015) Traffic Impact Analysis

The City-County Unified Development Ordinance requires that a Traffic Impact Analysis (TIA) study be prepared for development plans estimated to generate 150 or more vehicle trips during the peak hour. The proposed Erwin Square Apartment Development is located on the north side of Main Street west of Ninth Street. The proposed development is estimated to include 310 apartment units. The development is expected to be completed in 2012. The development is projected to generate 2,013 external daily trips, with 156 occurring during the A.M. peak hour (31 entering and 125 exiting) and 188 occurring during the P.M. peak hour (122 entering and 66 exiting).

Three access points are proposed. One access will be via an existing north-south spine road with an existing full access connection to Main Street. This existing north-south spine road is located on the west side of the site and it currently provides access to an adjacent development. A second access will be via an existing full movement driveway to Main Street on the eastern edge of the property. This existing low volume driveway also provides access to an adjacent development. The third access will be provided via the existing full access connection of the north-south spine road to Hillsborough Road. The TIA study was prepared for the proposed development by Kimley-Horn and Associates, Inc. in November 2010.

Study Area

The TIA study includes analysis of seven (7) intersections listed below:

- Main Street and Anderson Street / Fifteenth Street;
- Main Street and North-South Spine Road (Access #1);
- Main Street and Eastern Site Drive (Access #2);
- Main Street and Erwin Road / Ninth Street;
- Hillsborough Road and North-South Spine Road (Access #3) / Private Parking Lot;
- Hillsborough Road / Markham Avenue and Ninth Street;
- Ninth Street and Safeway Street.

Traffic Data Collection

The A.M. and P.M. peak hour intersection turning movement counts were taken between the hours of 7:00 am to 9:00 am and 4:00 pm to 6:00 pm during the September 2010.

Trip Generation

Site generated traffic for the proposed development was computed based on ITE's *Trip Generation Manual, 8th Edition, 2008*. The TIA used the following ITE trip generation uses for the proposed development:

USE	UNITS	ITE CODE
Apartments	310 units	220

The proposed use would generate a total of 2,013 daily trips with 156 trips occurring during the AM peak hour and 188 trips occurring during the PM peak hour.

Trip Distribution and Assignment

The assignment of site traffic on the study area roadway network was based on the following trip distribution percentages:

- To/From the East via Markham Avenue: 5% of site trips;
- To/From the East via Main Street: 35% of site trips;
- To/From the West via Hillsborough Road: 10% of site trips;
- To/From the West via Main Street: 10% of site trips;
- To/From the North via Ninth Street: 5% of site trips;
- To/From the South via Anderson Street: 35% of site trips.

Approved Developments and Background Growth

Approved developments are defined as approved or pending, but not yet constructed, projects within the vicinity of the subject project. The following approved developments were included in the TIA:

- Ninth Street North: This proposed mixed use development is located on the east and west sides of Ninth Street north of Safeway Street. The development includes: 145 apartment units; 76,853 square feet of office space; and 37,707 square feet of retail space.
- Hilton Garden Inn: This 130-room hotel is located adjacent to the southern property line of the proposed development.

In addition to the traffic from these proposed developments, a uniform annual compounded growth rate of 1% was utilized to determine the background traffic projections.

Transportation Improvement Program (TIP) Roadway Improvements

There are no funded TIP projects in the study area.

Capacity Analysis

Capacity analyses were performed using Synchro 7.0 for the AM and PM peak hours for the following scenarios:

- Existing (2010) conditions;

- No-Build (2013) conditions; (2010 Existing + Background Growth + Approved Development Traffic);
- Build (2013) conditions; (2014 No-Build + Site Traffic).

This development is located within a compact neighborhood where the adopted LOS standard is LOS E. The following table summarizes the average delay for the various Levels of Service (LOS) for unsignalized and signalized intersections:

	Signalized Intersections	Unsignalized Intersections
Level of Service	Average Vehicle Delay (Seconds)	Average Vehicle Delay (Seconds)
A	0-10	0-10
B	10-20	10-15
C	20-35	15-25
D	35-55	25-35
E	55-80	35-50
F	>80	>50

Main Street and Anderson Street / Fifteenth Street

The following table summarizes the Level of Service (LOS) for this signalized intersection.

Scenario	AM LOS	PM LOS
Existing (2010)	B	B
No-Build (2013)	B	B
Build (2013)	B	B

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Main Street and North-South Spine Road (Access #1)

The following table summarizes the Level of Service (LOS) for this unsignalized intersection.

Scenario	AM LOS	PM LOS
Existing (2010)	B*	B*
No-Build (2013)	B*	B*
Build (2013)	B*	B*

* Unsignalized operation, with LOS reported for the worst (SB) approach

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Main Street and Eastern Site Drive (Access #2)

The following table summarizes the Level of Service (LOS) for this unsignalized intersection.

Scenario	AM LOS	PM LOS
No-Build (2013)	B*	B*
Build (2013)	B*	B*

* Unsignalized operation, with LOS reported for the worst (SB) approach

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Main Street and Erwin Road / Ninth Street

The following table summarizes the Level of Service (LOS) for this signalized intersection.

Scenario	AM LOS	PM LOS
Existing (2010)	B	C
No-Build (2013)	C	C
Build (2013)	C	C

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Hillsborough Road and North-South Spine Road (Access #3) / Private Parking Lot

The following table summarizes the Level of Service (LOS) for this unsignalized intersection.

Scenario	AM LOS	PM LOS
Existing (2010)	B*	B*
No-Build (2013)	B*	B*
Build (2013)	C*	C*

* Unsignalized operation, with LOS reported for the worst approach

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Hillsborough Road / Markham Avenue and Ninth Street

The following table summarizes the Level of Service (LOS) for this signalized intersection.

Scenario	AM LOS	PM LOS
Existing (2010)	C	B
No-Build (2013)	C	C
Build (2013)	C	C

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Ninth Street and Safeway Street

The following table summarizes the Level of Service (LOS) for this unsignalized intersection.

Scenario	AM LOS	PM LOS
Existing (2010)	B*	C*
No-Build (2013)	B*	C*
Build (2013)	B*	C*

* Unsignalized operation, with LOS reported for the worst (EB) approach

The analysis indicates that the intersection will operate at acceptable levels of service for all scenarios and traffic conditions. No improvements are recommended or required at this intersection.

Summary of TIA Required Improvements

No roadway improvements are proposed or required within the study area to accommodate the additional site traffic.